Claims :

1. Control device for DC motors provided with a commutator for feeding their motor windings, said commutator having at least four sliding contacts, said device comprising a modulation stage generating at least one control signal modulated as to pulse width with a clock frequency substantially above the motor speed and a control circuit controlled by the at least one control signal and having at least one load branch feeding the commutator and being provided with an electronic switch controlled by the control signal modulated as to pulse width,
wherein the sliding contacts are combined to form at least two control groups, that the sliding contacts are combined within each control group to form shunt-fed pairs of sliding contacts and that each control group has its own load branch associated with it.

2. Control device as defined in claim 1, wherein each load branch comprises a freewheeling component and an electronic switch connected in series to the shunt-fed pairs of sliding contacts.

3. Control device as defined in claim 1, wherein the modulation stage generates a separate control signal modulated as to pulse width for each of the load branches.

4. Control device as defined in claim 1, wherein the at least two control signals have the same period duration.

5. Control device as defined in claim 1, wherein the at least two control signals have an identical pulse width modulation for the load branches.

6. Control device as defined in claim 1, wherein the at least two control signals are phase-locked in relation to one another.

7. Control device as defined in claim 3, wherein the at least two control signals are shifted in phase relative to one another.

8. Control device as defined in claim 1, wherein the switch-on time period of one of the load branches and the switch-off time period of the other one of the load branches are predetermined relative to one another and that the time interval between the switch-on time period of the one of the load branches and the switch-on time period of the other one of the load branches varies in accordance with the value of the PWM ratio to be set.

9. Control device as defined in claim 1, wherein a control of the at least two load branches is brought about such that one of the load branches is switched on when the other one of the load branches is switched off.

10. Control device as defined in claim 1, wherein in a first operating range each of the load branches is switched on only when the respectively other one of the load branches is switched off.

11. Control device as defined in claim 10, wherein in the first operating range each of the load branches is switched off with a gap in time prior to any switching on of the respectively other one of the load branches.

12. Control device as defined in claim 11, wherein in the first operating range a minimum period of time of 0.5 % of the period duration is provided between the switching off of each of the load branches and the switching on of the respectively other one of the load branches.

13. Control device as defined in claim 10, wherein in the first operating range the switch-on time period of the one load branch and the switch-off time period of the other load branch vary.

14. Control device as defined in claim 1, wherein in a second operating range one of the load branches is switched on only during the switching off or after the switching off of the other one of the load branches.

15. Control device as defined in claim 1, wherein in the second operating range each of the load branches is switched on after the switching on and prior to the switching off of the respectively other one of the load branches.

16. Control device as defined in claim 1, wherein the control circuit has a capacitor arranged on the supply side of the load branches.

17. Control device as defined in claim 2, wherein in each of the load branches the electronic switch is located between a first connection of the pairs of sliding contacts forming a respective control group and a first voltage connection and a second connection of the pairs of sliding contacts of the respective contact group is in communication with a second voltage connection, that a freewheeling branch is provided, said branch having as series connection a capacitor connected to the first voltage connection and an inductor connected to the second connection of the pairs of sliding contacts as well as a freewheeling diode located between a central tap between the capacitor and the inductor of the freewheeling branch and the first connection of the pairs of sliding contacts, a freewheeling current of the motor winding associated with the pairs of sliding contacts flowing via said freewheeling diode when the electronic switch is opened.

18. Control device as defined in claim 17, wherein at least two load branches are connected in parallel to the one freewheeling branch.

19. Control device as defined in claim 18, wherein the at least two load branches are connected in parallel to the freewheeling branch in the same way.

20. Control device as defined in claim 1, wherein the at least two load branches have the same circuitry configuration.

21. Control device as defined in claim 17, wherein a first connection of the capacitor of the freewheeling branch is connected to a first connection of the electronic switch by means of a line having an inductance of less than 50 nano henry.

22. Control device as defined in claim 17, wherein a second connection of the capacitor of the freewheeling branch is connected to the respective diode with a line having an inductance of less than 50 nano henry.

23. Control device as defined in claim 1, wherein the product of the value of the inductor and the value of the capacitor in the freewheeling branch is greater than the square of the cycle time of the control signals modulated as to pulse width.

24. Control device as defined in claim 1, wherein the value of the capacitor of the freewheeling branch is greater than the product of the maximum value of the current through the inductive load located between the respective pairs of sliding contacts with the ten-fold cycle time, divided by the voltage between supply voltage connection and ground connection.